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PRODUCT BROCHURE

NI FieldDAQ

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Overview

NI FieldDAQ is a high-performance DAQ device rated for the most extreme environments. Take measurements as close to the sensor as possible in a wide range of environmental and system conditions without settling for lower-quality data.

Pair FieldDAQ with your favorite NI software including FlexLogger™ Lite, NI's free logging software, or APIs and example programs for NI LabVIEW, Python, and C/C++.

Choose FieldDAQ for:

- Environmental test
- HALT test
- Structural test
- NVH analysis

- Rocket engine test
- In-flight structural test
- Off-road vehicle test
- Academic research (wind tunnels, temperature chambers)

Specifications

Measurement	Voltage (±10 V) with Sensor Power	Temperature	Sound/Vibration	Strain/Bridge
FieldDAQ model	FD-11601	FD-11614	FD-11634	FD-11637
Part Number	790065-01	790064-01	790066-01	785641-01
Channel Count	8	16	8	8
Supported Sensors	±10 V analog input with sensor power	Thermocouple type: J, K, T, E, N, B, R, S	IEPE accelerometers and microphones	Strain gage: quarter-, half-, and full-bridge
Input Connector Type	5-pin A-coded M12 connectors	Universal miniature thermocouple jack	8-pin A-coded M12 connectors	8-pin A-coded M12 connectors
Resolution	24 bits	24 bits	24 bits	24 bits
Sample Rate (Simultaneous)	Up to 102.4 kS/s/ch	Up to 85 S/s/ch	Up to 102.4 kS/s/ch	Up to 102.4 kS/s/ch
Sensor Power or Excitation Output	5 V–24 V, 600 mW per channel	N/A	4 mA	3 V, 5 V, or 10 V
Filtering	Anti-alias, Butterworth, comb filtering	50–60 Hz rejection	Anti-alias, Butterworth, comb filtering	Anti-alias, Butterworth, comb filtering
Isolation	Ch-Ch isolation 60 VDC working, 1,000 VRMS withstand			

Detailed Views

Devices with M12 Signal Connections

FD-11601, FD-11634, FD-11637

① Power input/output (L-Code M12 5-pin)

② 10/100/1000 Ethernet ports TSN-enabled network switch (X-Code M12 8-pin)

③ Eight analog input channels: voltage, IEPE, quarter-, half-, and full-bridge, and more

④ Channel status LEDs

⑤ Fanless design, operating temperature -40 °C to 85 °C

⑥ A-Code M12 standard connectors IP65/67 rated ingress protection: water and dust resistant

⑦ Mounting holes

Devices with Mini-TC Signal Connections

FD-11614

① Power input/output (L-Code M12 5-pin)

② 10/100/1000 Ethernet ports TSN-enabled network switch (X-Code M12 8-pin)

③ 16 thermocouple channels: 24-bit resolution Mini-TC connections for J, K, T, E, N, B, R, and S thermocouple types

④ Channel status LEDs

⑤ Fanless design, operating temperature -40 °C to 85 °C

⑥ M12 standard connectors IP65-rated ingress protection: water and dust resistant

⑦ Mounting holes

Why FieldDAQ?

You can connect FieldDAQ devices to NI's PXI, CompactDAQ, and CompactRIO test hardware to expand your system in any direction your test or research needs, while using the most open software options on the market.

Key Features

FieldDAQ devices provide precision performance in extreme conditions.

- 24-bit resolution and sample rates up to 100 kS/s for fast, accurate measurements
- Sensor-specific signal conditioning and filtering for voltage, strain/bridge, accelerometer, microphone, and thermocouple measurements
- Built-in switch for easy daisy-chained distribution

Ruggedness

Take high-quality measurements as close to the sensor as possible in all-weather conditions like rain, sleet, snow, or mud.

- Rugged, IP65/67 rated waterproof and dust-tight design with shock and vibration resistance over 100 g/10 grms conditions
- Wide range of operating temperatures from -40 °C to 85 °C
- Standard industrial M12 connectors prevent cables from detaching during operation
- Channel-channel isolation (60 V DC continuous/1,000 VRMS transient) reduces noise from ground loops and protects instrumentation circuitry from high transient voltages

High-Performance Measurements

FieldDAQ delivers stable measurements across a wide temperature range, with an impressively low noise floor.

- Thermally stable design allows for minimal accuracy drift over -40 °C to 85 °C range
- 24-bit resolution and simultaneous sample rates up to 100 kS/s detects and acquires full-range signals with varying amplitudes and bandwidths
- Premium signal conditioning and diagnostic features—built-in filtering, open thermocouple detection, and shunt calibration reduce the effect of external interference and increase measurement accuracy
- Shortened sensor cables to minimize noise by digitizing as close as possible to the sensor

Tight Synchronization

FieldDAQ synchronizes measurement data between devices over long distances using Time Sensitive Networking (TSN), which is a set of standards in the IEEE 802.1 Ethernet group.

- Distributed TSN architecture reduces cabling cost, installation time, and enclosure requirements with synchronization accuracy <1 µs
- Connect FieldDAQ devices and other TSN devices together, such as NI CompactDAQ or NI CompactRIO
- Daisy-chain devices without the need for external switches or multiple power supplies since each device has an integrated network switch and built-in power circuitry

Software

NI has decades of experience as an industry leader for test and measurement software. Options for FieldDAQ software include:
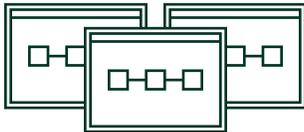
Developing custom software with drivers and example programs for:

- LabVIEW
- Python, C/C++, VB.NET, and C#

Logging data with a real-time display using NI FlexLogger™ lite, free data acquisition software.

Modernizing your lab and standardizing your test frameworks with the NI LabVIEW+ Suite.
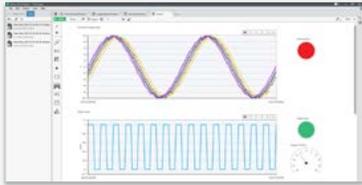
Get the Most Out of Your Test

NI recommends LabVIEW for an automated test system that combines data acquisition with analysis, logic, logging, and a professional real-time display.

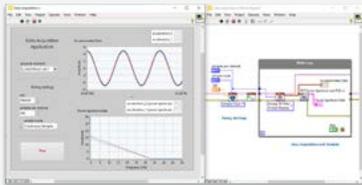## Keep Your Software. Upgrade Your Hardware.

Software developed for your existing NI DAQ device using the NI-DAQmx driver should be generally compatible with NI FieldDAQ.

NI Data Acquisition Software

FlexLogger Lite (free download)

- Configure measurements
- Create real-time displays
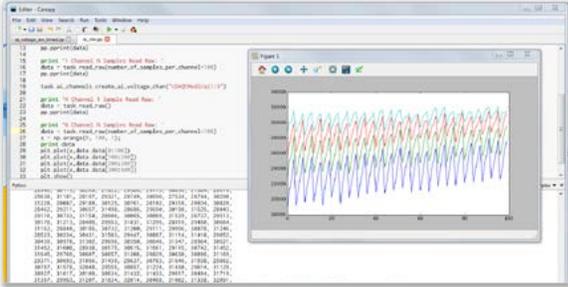- Log results

LabVIEW

- Create a professional UI
- Integrate all your instruments
- Program like you think
- Integrate code from Python, C,
  or MathWorks® MATLAB® software

LabVIEW+ Suite for Test Professionals

The LabVIEW+ Suite is built for test professionals in electronics and electromechanical test. It provides software solutions to reduce development time, increase data usage, and prevent rework.
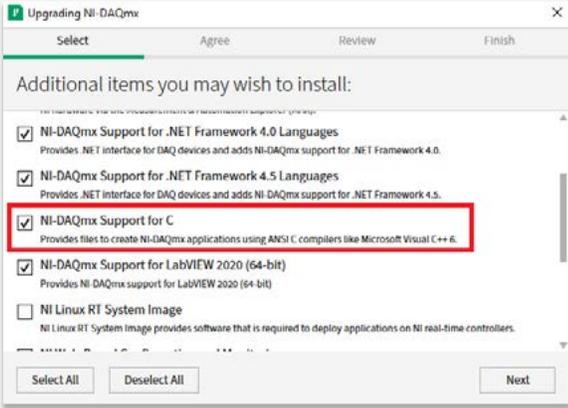
Programming Language Support

Python

- nidaqmx package available on GitHub
- Support for Cpython 3.8 and PyPy3
- Example programs included

C/C++, VB 6.0, VB.NET, and C#

- API installs with the NI-DAQmx driver
- Libraries of functions for all DAQ operations
- Example programs included

Accessories

A single FieldDAQ device requires the following accessories:

- External power supply
- Power cable
- Ethernet cable
- I/O cable(s)

All unused M12 ports or mini-TC terminals must have caps or mini-TC plugs with protective boot, respectively, to meet IP65/IP67 requirements.

Power

Power your FieldDAQ device with an external power supply and power cable.

Power Supply

Power your FieldDAQ device with an IP67-rated power supply.

Description	Part Number	
IP67 Power Supply, 24 VDC, 6 A	147464-01	

Cables

Choose a cable to connect your power supply to the FieldDAQ power input.

Description	Part Number	Length	
L-code M12 5-Pin Female-Pigtail	786172-01	1 m	
	786172-02	2 m	
	786172-03	3 m	

Power additional FieldDAQ devices by connecting them daisy-chain style, with one of these cables per additional module.

Description	Part Number	Length	
L-code M12 5-Pin Female-Male	786173-01	1 m	
	786173-03	3 m	
	786173-0R3	0.3 m	

Tools for Securing the Connection

Use a torque wrench to tighten the power cable connection and ensure a good seal.

Description	Part Number
M12 Torque Wrench, Power	786182-01

Ethernet

Connect your FieldDAQ to Ethernet and secure the connection with the following accessories.

Cables

Connect your first FieldDAQ device to Ethernet using one of these IP67 shielded cables.

Description	Part Number	Length	
X-Code M12 8-Pin Male to RJ45	785944-01	1 m	
	785944-02	2 m	
	785944-03	3 m	
	785944-10	10 m	
X-Code M12 8-Pin Male to RJ45, Right-angle	786171-01	1 m	
	786171-02	2 m	
	786171-03	3 m	

Connect subsequent FieldDAQ devices to Ethernet by daisy-chaining them together, using one of these IP67 shielded cables per additional module.

Description	Part Number	Length	
X-Code M12 8-pin Male-Male	785946-01	1 m	
	785946-03	3 m	
	785946-0R3	0.3 m	
X-Code M12 8-Pin Male-Male, Right-angle	785945-0R3	0.3 m	

Tools for Securing the Connections

Use a torque wrench to tighten the Ethernet cable connections and ensure a good seal.

Description	Part Number
M12 Torque Wrench, Ethernet and I/O	786181-01

Signal Cables

Select the right IP67 shielded I/O cable to match your specific measurement needs.

Voltage Input (FD-11601, 790065-01)

Choose from the following cables to measure voltage.

Description	Part Number	Length	
A-Code M12 5-Pin Male-Pigtail	785950-01	1 m	
	785950-03	3 m	
	785950-0R3	0.3 m	
A-Code M12 5-Pin Male-Pigtail, Right-angle	785949-01	1 m	
	785949-03	3 m	

IEPE/Sound and Vibration (FD-11634, 790066-01)

Choose from the following cables to measure signals from IEPE and non-IEPE sensors such as accelerometers, tachometers, proximity probes, and even TEDS sensors.

Description	Part Number	Length	
A-Code M12 5-Pin Male-Pigtail	785950-01	1 m	
	785950-03	3 m	
	785950-0R3	0.3 m	
A-Code M12 5-Pin Male-Pigtail, Right-angle	785949-01	1 m	
	785949-03	3 m	
A-Code M12 5-Pin Male-BNC Female	787037-01	1 m	
	787037-03	3 m	
	787037-0R3	0.3 m	

A-Code M12 5-Pin Male-BNC Female, Right-angle	787038-01	1 m	
	787038-03	3 m	
	787038-0R3	0.3 m	

Strain/Bridge Input (FD-11637, 785641-01)

Choose from the following cables to measure strain from quarter-, half-, and full-bridge sensors.

Description	Part Number	Length	
A-Code M12 8-Pin Male-Pigtail	786325-01	1 m	
	786325-03	3 m	
	786325-0R3	0.3 m	
A-Code M12 8-Pin Male-Pigtail, Right-angle	786326-03	3 m	
	786326-0R3	0.3 m	

Connectors

Use a field wirable connector to adapt the pigtail end of a sensor wire to an M12 connector and ensure an IP67-rated connection when completed correctly.

Description	Part Number	
Housing: A-Code M12 Male straight Connection: Screw termination (use end splice)	5-Pin	785941-01	
	5-Pin, Right-angle	785942-01	
	8-Pin	785940-01	
	8-Pin, Right-angle	785943-01	

Tools for Securing I/O Connections

Use a torque wrench to tighten the I/O cable connections and ensure a good seal.

Description	Part Number
M12 Torque Wrench, Ethernet and I/O	786181-01

I/O Caps/Covers for Sealing Out Dust and Water

Protect your equipment from the elements with the following caps.

M12 (FD-11601, -11634, -11637)

M12 connectors must be mated to cables or have caps installed on them to meet IP65/IP67 requirements. Cover the unused connectors with either plastic or metal caps whenever water, dust, or dirt are present.

Metal caps have the highest durability.

Both (Plastic and Metal)	Metal
✓ Dustproof ✓ Waterproof	✓ Highest durability

Select caps to cover unused ports.

Description		Part Number	
Universal M12 Plastic	Ethernet, I/O (Male) Qty. 10	786177-01	
	Power (Female) Qty. 1	786180-01	
Universal M12 Metal	Ethernet, I/O (Male) Qty. 1	786178-01	
	Power (Female) Qty. 1	786179-01	

Mini-TC (FD-11614)

To protect against ESD, water, and dirt, install unconnected mini-TC plugs into all unused terminals, and install a Mini-TC Connector Protection Boot on all mini-TC plugs.

Description	Part Number	
Mini-TC Connector Protection Boot	786394-01	

Services

Hardware Service Program Benefits

	Warranty	Standard Service Program	Premium Service Program	Description
Duration	1 year, included	Up to 3 years, recommended	Up to 3 years, optional	
Uptime Assurance				
Repair Coverage	✓	✓	✓	NI restores your device's functionality and includes firmware updates and factory calibration.
Technical Support		✓	✓	NI provides access to support resources for your hardware.
System Configuration, Assembly, and Test		✓	✓	NI technicians assemble, install software on, and test your system per your custom configuration prior to shipment.
Advanced Replacement			✓	NI stocks replacement hardware that can be shipped immediately if a repair is needed.
System RMA			✓	NI accepts the delivery of a fully assembled system when performing repair services.
Calibration Add-Ons				
Traceable Calibration Plan		$	$*	Verification and adjustment. Includes "As Found" and "As Left" data and pass/fail status for each test point.
Compliant Calibration Plan		$$	$$	ANSI/NCSLI Z540-1 standard calibration. Includes verification of measurement performance and adjustment (when possible), provision of full "As Found" and "As Left" measurement data and an evaluation of measurement uncertainty.
Accredited Calibration Plan		$$$	$$$	ISO/IEC17025 accredited laboratory calibration. Includes expanded uncertainty values for each measurement point as part of the Calibration Certificate and the logo of the accreditation body.

* Purchasing hardware PSP with a Traceable Calibration Plan (five-day turnaround time) entitles you to expedited calibration service (three-day turnaround time) at no additional charge.

Additional Services

Technical Support	Description	Next Steps
Technical Consulting Services (TCS)	Our TCS experts will help you select the correct programming environments and protocols based on the outcomes you are trying to achieve. They will also provide guidance on usage, troubleshooting, and best practices during the start, development, and maintenance of your project. NI Technical Consulting Services include a fixed number of hours requested by the customer to be invested in Design Assistance, Code Review, and Upgrade Assistance.	Contact your Account Manager to learn more as well as how to purchase NI Technical Consulting Services.
Dedicated Support Group (DSG)	DSG service offers you a personalized and reliable experience to accomodate several of your needs and questions, from routine troubleshooting to complex scenarios. A hand-selected team of specialists will be ready to help you navigate through and resolve support requests quickly.	Contact your Account Manager to learn more as well as how to purchase Dedicated Support Group.
Calibration		
Calibrated Replacement	NI ships a calibrated unit equivalent to the unit under coverage. Once received, the customer exchanges the unit and sends the previously installed unit back to NI. This service is only available for Application Systems or with a Hardware Service Agreement.	Email **services@ni.com** to evaluate availability.
Onsite Calibration	The calibration is performed at the customer location by a calibration technician. This a scheduled event and minimum requirements need to be met for it to be sold.	Email **services@ni.com** to evaluate availability.
Training		
Instructor-Led Training	Whether you are new to NI products or have been using them for years, NI offers courses and certification programs to help you develop applications, work with NI hardware, and more.	Find application learning paths and view the live course schedule at **ni.com/training**.
On-Demand Training	Discover NI's complete library of on-demand lessons and learning paths available for free and for purchase.	Find on-demand courses to start learning now at **learn.ni.com/catalog**.
Education Service Credits	You can purchase education services credits now with available budget and redeem them within the year for any training or certification offering.	Learn more about purchase options at **ni.com/training**.
Training Membership	A training membership is a cost-effective way to take multiple live training courses. This program provides one year of unlimited access, for one registered user, to instructor-led training and certification exams.	Learn more about purchase options at **ni.com/training**.
Uptime Assurance		
Long Lifecycle Service Program	NI keeps your test stations operational by offering Long Lifecycle Services for hardware. This ensures your hardware remains working and in specifcation for the duration of your test station's life.	Contact your Account Manager or email **services@ni.com** to evaluate availability.

System Integration on Your Terms

NI offers a variety of solution integration options customized to your application-specific requirements. You can use your own internal integration teams for full system control or leverage the expertise of our worldwide network of NI Partners to obtain a turnkey system.

Contact your account manager or call or email us to learn more about how NI can help you increase product quality and accelerate test timelines at (888) 280-7645 or info@ni.com.

NI Services and Support

Ihr NI-Partner: AMC

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Integration Partner

SYSTEM INTEGRATOR